REMARKS/ARGUMENTS

Responsive to the Official Action mailed February 10, 2005, applicants have amended their claims in an earnest effort to place this case in condition for allowance. Specifically, claim 10 has been cancelled, and claims 9 and 12 amended. Reconsideration is respectfully requested.

In the Action, the Examiner has rejected the pending claims under 35 U.S.C. §112, questioning the recited claim provision that the present nonwoven fabric construct is formed from a "relatively lightly bonded" spunbond precursor web. It is believed that the meaning of this claim terminology will be readily apparent to those skilled in the art from applicants' disclosure, and accordingly, the Examiner's rejection is respectfully traversed.

As will be familiar to those skilled in the art, a spunbond nonwoven fabric web is typically formed from substantially continuous polymeric filaments which are extruded and drawn, and thereafter collected for fabric formation. Because the extruded and drawn filaments do not exhibit significant self-adherence to each other, this type of nonwoven fabric is typically subjected to thermal bonding, typically thermal-point bonding, whereby the extruded filaments are bonded together at bonded regions formed such as by a suitable heated embossing roller. In this manner, the substantially continuous filaments re firmly integrated together, thereby forming a strong and economical fabric construct.

In significant distinction, the present invention contemplates that the continuous filaments of the recited precursor web are *not* subjected to this typical degree of thermal-bonding, but rather are subjected only to a relatively light level of thermal bonding. Thus, when subjected to hydroentanglement, the relatively lightly bonded filaments are separated *without substantial breakage of the filaments*.

This is discussed in applicants' specification at page 4:

> Development has shown if the spunbond precursor web is only relatively lightly bonded, hydroentanglement acts to break or disrupt the bonds without substantially breaking the continuous filaments from which the spunbond precursor web is formed. As a consequence, a lower basis weight fabric formed in accordance with the present invention may be formed to include substantially continuous filaments (from a relatively lightly bonded spunbond precursor web) . . . .The degree of bonding of the precursor web is specifically selected to facilitate handling of the web, with the contemplation that higher strength fabrics can be achieved if the filaments of the precursor web are maintained in substantially continuous form. In accordance with the present invention, it is contemplated that the spunbond precursor web is subjected to bonding which provides no more than minimum tensile strength which permits winding and unwinding of the precursor web.

Thus, it is respectfully submitted that this teaching in applicants' specification, which is generally contrary to the typical manner in which spunbond fabrics are formed, will be readily understood and appreciated by those skilled in the art. It is noted that similar claim terminology was set forth in applicants' parent U.S. Patent No. 6,321,425.

In rejecting the pending claims under 35 U.S.C. §103, the Examiner has relied upon Japanese Patent No. 10-140148 (corresponding to U.S. Patent No. 6,080,466), to Yoshimura et al., in view of U.S. Patent No. 5,151,320, to Homonoff et al. However, it is respectfully maintained that these references, even when combined, do not teach or suggest applicants' novel nonwoven fabric construct, and accordingly, the Examiner's rejection is respectfully traversed.

Simply stated, it is believed that there is simply no teaching or suggestion in either of the cited references of forming a *lightly bonded* spunbond precursor web, which, when subjected to hydroentanglement, breaks or disrupts the bonds *without substantial breakage of the continuous filaments*. In this manner, the filaments can be entangled with each other, enhancing the desired physical properties of the resultant web.

In the Action, the Examiner notes that the present claims do not preclude the inclusion of additional layers. This is intended, since it is within the scope of applicants' invention that their novel nonwoven fabric construct can be combined with other layers. Nevertheless, this aspect of the teachings of the prior art should not be overlooked; since these references contemplate integration of layers with a spunbond fabric wherein *bonds are not intended to be broken to facilitate filament entanglement.*

In the Action, the Examiner states:

> Yoshimura teaches applying water jets to the sheet of Yoshimura in order to entangle the pulp sheet with the spunbonded layer. Since the spunbonded layer is bonded, in order to entangle the pulp fibers with the spunbonded layer, the bonds of the spunbonded layer would have to be broken.

Applicants must respectfully submit that fiber integration, and bond breakage, are typically directly related to the levels of *energy input* attendant to hydroentanglement. For a conventionally bonded spunbonded web (to which it is believed the teachings of Yoshimura are limited) entangling energies can be selected to facilitate integration of pulp fibers into the spunbonded filament layer. If energy input levels are elevated to provide greater entanglement, the Examiner is correct, "the bonds of the spunbond layer would have to be broken". However, in a conventionally-bonded fabric, this *inevitably results in substantial breakage of the continuous filaments*, in clear and significant distinction from applicants' claimed nonwoven fabric construct.

When the Examiner states that "it is reasonable to presume that the Yoshimura material would react the same way", applicants must respectfully disagree. Yoshimura is *devoid of any teachings* of selecting a thermal bonding level which is the minimum required for winding and unwinding the web, while facilitating bond breakage, without substantial filament breakage, attendant to hydroentanglement.

Applicants respectfully refer to Example 1 of Yoshimura:

> A long fiber nonwoven fabric consisting of integrated polypropylene long fibers having many point-fused regions in

> which said polypropylene long fibers are self-fused to each other was prepared.

Clearly, this patent is referring to conventional spunbonding, with no teaching or suggestion that a lightly bonded precursor web should be employed to facilitate hydroentanglement of the filaments, without substantial filament breakage.

Clearly, one skilled in the art would understand Yoshimura et al. to be principally concerned with *creping* as a treatment subsequent to hydroentanglement:

> Creping is a treatment for providing crepe-like folds in a composite sheet to reduce the size in machine direction, thus increasing the elongation in the machine direction. . . . Creping not only increases the elongation in the machine direction, but also breaks hydrogen bonds between and within pulp fibers. Thus, creped composite sheets are no longer stiff and require fabric-like soft and supple properties (column 2, lines 18 *et seq.*, '466 patent).

Applicants respectfully maintain that the Homonoff reference fails to overcome the clear deficiencies in the teachings of the principal Yoshimura et al. reference. As previously noted, Homonoff et al. specifically *teaches away* from the present invention, in stating that "the type of prebonding of the base material is not believed to be critical", and that "a bond area as low as 3-4% up to about 50% bond area" shows that this reference clearly does not teach or contemplate subjecting substantially continuous filaments to hydroentanglement so that bonds of the precursor web are broken *without substantial breakage of the filaments*.

The clear deficiencies in Homonoff et al in teaching the present invention as claimed are further evidenced by further study of this reference. As discussed at column 4, lines 58 *et seq.*, after the material is cross-stretched, it can be *heat-set*::

> After the cross-stretched spunbonded base web material has been heat-set so as to stabilize the material in its stretched condition, there is no need to maintain the web in its tensioned condition, and therefore, it can be released from the cross-stretched tensioning or tentered environment.

At column 6, line 11 *et seq.*, Homonoff et al goes on to describe hydroentanglement:

> After assembly of the multi-layer structure, it is subjected to a low to medium pressure hydroentanglement operation . . . The jets are operated at a pressure sufficient to provide limited displacement and entanglement of some of the wood pulp fibers.

Again, there is no recognition or teaching in this reference of breaking the bonds between the substantially continuous filaments, without substantial filament breakage, in accordance with the present invention.

Thus, applicants must respectfully maintain that neither of the cited references teach or suggest applicants' novel nonwoven fabric construct, and as such, formal allowance of claims 9-12 is believed to be in order and is respectfully solicited. Should the Examiner wish to speak with applicants' attorneys, they may be reached at the number indicated below.

The Commissioner is hereby authorized to charge any additional fees which may be required in connection with this submission to Deposit Account No. 23-0785.

Respectfully submitted,

By_____
Stephen D. Geimer, Reg. No. 28,846

WOOD, PHILLIPS, KATZ, CLARK & MORTIMER
500 West Madison Street, Suite 3800
Chicago, Illinois 60661-2511
312/876-1800